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IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA

INFINEON TECHNOLOGIES AG,

Plaintiff,

v.

VOLTERRA SEMICONDUCTOR
CORPORATION,

Defendant.

No. C 11-6239 MMC

ORDER CONSTRUING CLAIMS

Before the Court is the parties' dispute regarding the proper construction of six terms in U.S. Patent 5,945,730 ("730 Patent"). Plaintiff Infineon Technologies AG ("Infineon") and defendant Volterra Semiconductor Corporation ("Volterra") have submitted briefing and evidence in support of their respective positions. The matter came on regularly for hearing on May 19, 2014. David G. Wille and Jefferey D. Baxter of Baker Botts LLP appeared on behalf of Infineon. Edward R. Reines and Sonal N. Mehta of Weil, Gotshal & Manges LLP appeared on behalf of Volterra.

Having considered the parties' respective written submissions and the arguments of counsel, the Court rules as follows.

LEGAL STANDARD

In construing disputed claims, a district court's primary source is the intrinsic evidence of the patent. See Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582-83

1 (Fed. Cir. 1996). Intrinsic evidence includes “the claims, the specification and, if in
2 evidence, the prosecution history,” see id., 90 F.3d at 1982, as well as the abstract, see
3 Hill-Rom Co. v. Kinetic Concepts, Inc., 209 F.3d 1337, 1341 (Fed. Cir. 2000). Language
4 used in the patent is given its ordinary meaning, unless it is clear that the inventor intended
5 the terms to have a different meaning. See Vitronics, 90 F.3d at 1582. The patent
6 specification “may act as a sort of dictionary, which explains the invention and may define
7 terms used in the claims.” See Markman v. Westview Instruments, Inc., 52 F.3d 967, 979
8 (Fed. Cir. 1995), aff’d, 517 U.S. 370 (1996).

9 Although a district court considers the specification in determining the meaning of a
10 disputed claim, it generally is improper to limit the scope of the claim to the examples set
11 forth in the specification “absent a clear indication in the intrinsic record that the patentee
12 intended the claims to be so limited.” See Dealertrack, Inc. v. Huber, 674 F.3d 1315, 1327
13 (Fed. Cir. 2012). The claims of the patent, not the specification, “measure the invention.”
14 See SRI Int’l v. Matsushita Elec. Corp. of America, 775 F.2d 1107, 1121 (Fed. Cir. 1985).
15 “Where the specification makes clear that the invention does not include a particular
16 feature,” however, “that feature is deemed to be outside the reach of the claims of the
17 patent, even though the language of the claims, read without reference to the specification,
18 might be considered broad enough to encompass the feature in question.” See Thorner v.
19 Sony Computer Entm’t Am. LLC, 669 F.3d 1362, 1366 (Fed. Cir. 2012) (internal quotation
20 and citation omitted).

21 In addition to intrinsic evidence, the court may consider extrinsic evidence, which
22 “consists of all evidence external to the patent and prosecution history, including expert and
23 inventor testimony, dictionaries, and learned treatises.” See Phillips v. AWH Corp., 415
24 F.3d 1303, 1317 (Fed. Cir. 2005) (en banc). Extrinsic evidence “can help educate the court
25 regarding the field of the invention and can help the court determine what a person of
26 ordinary skill in the art would understand claim terms to mean.” See id. at 1319.
27 Nevertheless, “while extrinsic evidence can shed useful light on the relevant art, . . . it is
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less significant than the intrinsic record in determining the legally operative meaning of claim language.” See id. at 1317 (internal quotations and citation omitted).

DISCUSSION

The patent at issue relates generally to semiconductor power devices, see ‘730 patent, col. 1:5, and describes as its primary objective the reduction of a semiconductor device’s “on-resistance,” thereby enabling such device to “support higher current applications at the same power dissipation level (or transistor area)” or to “provide lower power dissipation requiring smaller packaging,” see ‘730 patent, col. 1:18-27. The parties dispute the proper construction of six terms contained in the claims of the subject patent: (1) “metal conductors,” (2) “bump,” (3) “frame,” (4) “connection portions,” (5) “interdigitated,” and (6) “bumps on the first metal conductors are substantially aligned in first lines which extend in a second direction” and “bumps on the second metal conductors are substantially aligned in second lines which extend in the second direction.”

Pursuant to Markman v. Westview Instruments, Inc., 517 U.S. 370, 384-91 (1996), the Court next construes the disputed claims.

1. “Metal Conductors” (Independent Claim 1; Dependent Claims 2, 4, 5)

The parties dispute the proper construction of “metal conductors” as found, for example, in Claim 1 of the ‘730 patent, as follows:

1. A semiconductor power device comprising:

first and second semiconductor regions,

a plurality of first **metal conductors** coupled to the first semiconductor region, each of the plurality of first **metal conductors** having at least one **bump** in contact therewith,

a plurality of second **metal conductors** coupled to the second semiconductor region, each of the plurality of second **metal conductors** having at least one bump in contact therewith, and

a frame formed of high conductivity material, the frame comprising a plurality of first connection portions for connecting to the at least one bumps of the first **metal conductors** and a plurality of second connection portions for connecting to the at least one bumps of the second **metal conductors**, the frame providing external connections to the semiconductor regions of the device.

1 See '730 patent, col. 5:13-30 (emphasis added to designate disputed term).

2 Infineon proposes the term be given its plain and ordinary meaning, or, alternatively,
3 that it be construed as "a metal that permits an electric current to flow." Volterra proposes
4 the term be construed as "a first/second part of the final metal layer."¹ For the reasons
5 stated by Infineon, the Court finds the patent neither disclaims under-bump metallization
6 ("UBM") or a redistribution layer ("RDL"), nor otherwise limits the term "metal conductor" to
7 the final metal layer of the die.

8 Accordingly, the Court hereby construes "metal conductors" as "a metal that permits
9 an electric current to flow."

10 **2. "Bump" (Independent Claims 1, 10; Dependent Claims 4, 5, 9)**

11 The parties dispute the proper construction of "bump" as found, for example, in
12 Claim 1 of the '730 patent, as follows:

13 1. A semiconductor power device comprising:

14 first and second semiconductor regions,

15 a plurality of first metal conductors coupled to the first semiconductor region,
16 each of the plurality of first metal conductors having at least one **bump** in
contact therewith,

17 a plurality of second metal conductors coupled to the second semiconductor
18 region, each of the plurality of second metal conductors having at least one
bump in contact therewith, and

19 a frame formed of high conductivity material, the frame comprising a plurality of
20 first connection portions for connecting to the at least one **bumps** of the first
metal conductors and a plurality of second connection portions for connecting
21 to the at least one **bumps** of the second metal conductors, the frame
providing external connections to the semiconductor regions of the device.

22 See '730 patent, col. 5:13-30 (emphasis added to designate disputed term).

23 Infineon proposes the term be construed as "raised metal contact." Volterra
24 proposes the term be construed as "a raised metal structure formed partially on the final
25 metal layer through an opening of a passivation layer." The parties' arguments made with
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27 ¹ As further explained by Volterra at the hearing, its proposed construction means,
28 essentially, "the final metal layer in the die."

respect to the construction of “bump” raise essentially the same issues as the arguments with respect to the construction of “metal conductors,” and, in particular, whether the claimed “metal conductors” need be the “final metal layer” in the die.

Accordingly, for the reasons stated by Infineon, the Court hereby construes “bump” as “a raised metal contact.”

3. “Frame” (Independent Claims 1 and 10; Dependent Claim 9)

The parties dispute the proper construction of “frame” as found, for example, in Claim 1 of the ‘730 patent, as follows:

1. A semiconductor power device comprising:

. . .

a **frame** formed of high conductivity material, the **frame** comprising a plurality of first connection portions for connecting to the at least one bumps of the first metal conductors and a plurality of second connection portions for connecting to the at least one bumps of the second metal conductors, the **frame** providing external connections to the semiconductor regions of the device.

See ‘730 patent, col. 5:24-30 (emphasis added to designate disputed term).

Infineon proposes the term be construed as “lead frame.” Volterra proposes the term be construed as “a support structure that includes connection portions for connecting to the bumps and other portions for connecting to a PCB.” The Court finds there is no dispute that the claimed frame is a lead frame, and further finds the word “other” adds a limitation not found in the claims.

Accordingly, for the reasons stated by Infineon, the Court hereby construes “frame” as “lead frame.”

4. “Connection Portions” (Independent Claims 1, 10; Dependent Claim 9)

The parties dispute the proper construction of “connection portions” as found, for example, in Claim 1 of the ‘730 patent, as follows:

1. A semiconductor power device comprising:

. . .

a frame formed of high conductivity material, the frame comprising a plurality of first **connection portions** for connecting to the at least one bumps of the first

metal conductors and a plurality of second **connection portions** for connecting to the at least one bumps of the second metal conductors, the frame providing external connections to the semiconductor regions of the device.

See '730 patent, col. 5:24-30 (emphasis added to designate disputed term).

Infineon proposes the term be construed as "parts of the frame that extend across at least a portion of the die and are spaced apart from one another." Volterra proposes the term be construed as "portions of the frame for connecting to the bumps." The Court finds the term, read in context, needs no construction beyond its plain and ordinary meaning, and further finds Infineon's construction includes limitations not found in the claims, while Volterra's construction in essence reiterates language immediately following the term.

Accordingly, the Court does not further construe "connection portions."

5. "Interdigitated" (Dependent Claim 2)

The parties initially disputed the proper construction of "interdigitated" as found in Claim 2 of the '730 patent, as follows:

2. A semiconductor power device according to claim 1 wherein the plurality of first metal conductors are **interdigitated** with the plurality of second metal conductors.

See '730 patent, col. 5:31-33 (emphasis added to designate disputed term).

Infineon initially proposed the term be construed as "alternately arranged in adjacent rows," and Volterra initially proposed the term be construed as "structures of interlocking fingers." At the hearing, the parties agreed that the Court should construe the term as "alternately arranged in adjacent, but not touching, rows."

Accordingly, the Court hereby construes "interdigitated" as "alternately arranged in adjacent, but not touching, rows."

6. "Bumps on the First Metal Conductors Are Substantially Aligned in First Lines Which Extend in a Second Direction" and "Bumps on the Second Metal Conductors Are Substantially Aligned in Second Lines Which Extend in the Second Direction" (Dependent Claim 5)

The parties dispute the proper construction of "the bumps on the first metal conductors are substantially aligned in first lines which extend in a second direction" and "bumps on the second metal conductors are substantially aligned in second lines which

1 extend in the second direction” as found in Claim 5 of the ‘730 patent, as follows:

2 5. A semiconductor power device according to claim 1 wherein each of the plurality
3 of first and second metal conductors are arranged in parallel extending in a first
4 direction and wherein each of the plurality of first and second metal conductors have
5 a plurality of bumps arranged along the respective metal conductor in the first
6 direction, such that the **bumps on the first metal conductors are substantially
aligned in first lines which extend in a second direction** and such that the
**bumps on the second metal conductors are substantially aligned in second
lines which extend in the second direction.**


7 See ‘730 patent, col. 5:43-53 (emphasis added to designate disputed term).

8 The parties’ dispute centers around their disagreement as to whether the claim
9 requires the second direction to be different from the first. Infineon contends the term
10 should be given its “plain and ordinary meaning, except for ‘bumps’ as addressed
11 separately in [Infineon’s] briefing” (see Opening Br. at 23:6-7); according to Infineon, the
12 “plain and ordinary meaning” does not require a different second direction. Volterra
13 proposes the term be construed as “two-dimensional pattern of bumps where bumps to be
14 connected to the frame are aligned in a direction different from the first direction.” Although
15 the Court, for the reasons stated by Volterra, agrees that the claim requires the first and
16 second directions be different, the Court finds Volterra’s construction may be read as
17 including limitations not found in the claim.

18 Accordingly, the Court hereby construes the disputed language in claim 5 as “an
19 arrangement of bumps where the bumps on the two sets of metal conductors, in addition to
20 extending in a first direction along the metal conductors, are aligned in a second direction
21 that is different than the direction of the metal conductors.”

22 **IT IS SO ORDERED.**

23 Dated: May 27, 2014

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25 MAXINE M. CHESNEY
26 United States District Judge
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